

HARTSVILLE NUCLEAR PLANT - UNIT A1 - BREAKDOWN IN

THE QUALITY CONTROL PROGRAM AT INDUSTRIAL

ENGINEERING WORKS ON THE REACTOR PRESSURE

VESSEL SHIELD WALL

REPORT NUMBER 2 (FINAL)

NCR'S HNP-A-037 AND HNP-A-043

REPORTABLE UNDER 10CFR 50.55(e)

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On April 17, 1979, TVA notified NRC-OIE Region II Inspector, Mike Gouge, of a potentially reportable 10CFR 50.55(e) condition that has 10CFR Part 21 implications regarding a breakdown in the quality control program at Industrial Engineering Works (IEW). The breakdown involves major repair being made to the reactor pressure vessel (RPV) shield wall by IEW without notification and approval of the technical engineer (GE), lack of non-destructive examination (NDE) of the repair, and lack of documentation of the repair.

On May 17, 1979, TVA submitted an interim report to NRC-OIE Region II that contained all of the details about the two NCR's available at that time. This is our final report on the subject NCR's.

Description of Deficiency

NCR HNP-A-037 was written to describe the following condition:

During the fabrication of the Hartsville Unit A1 RPV shield wall, IEW incorrectly cut 16 vertical edges of the shield wall shell plates. Upon the vendor's discovery of the error, the edges were built up by deposition of weld metal (buttering) and cut correctly according to the fabrication drawings.

Upon receipt of the first tier of the RPV shield wall by TVA, it was discovered by TVA construction forces that the buttered welds were of poor quality, contained trapped slag, and exhibited lack of fusion. Subsequent discussions between IEW and TVA construction forces revealed:

1. None of the edge buttering had been documented or reported as required by C. F. Braun specification 300-08 AB, paragraphs 17.7.2 and 18.1.6.
2. NDE of the buttered edges was not performed as required by C. F. Braun specification 300-08 AB, paragraph 19.1.2.

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3. Permission was neither requested nor received from the technical engineer (GE) to accomplish the edge buttering as required by C. F. Braun specification 300-08 AB, paragraph 17.7.1.

NCR HNP-A-043 was originally written to document that one of the edge repairs had been by "slugging" rather than by buttering. Further discussions between the vendor (IEW) and TVA revealed that what TVA thought was a "slugged" weld was only a portion of the backing bar IEW had used to facilitate buildup of the incorrectly cut edge that had not been properly air gouged and backwelded. TVA agrees with IEW's explanation of this alleged "slugging." Subsequently, the scope of NCR HNP-A-043 reduces to further documentation of the buttering of incorrectly cut vertical edges originated in NCR HNP-A-037.

Cause of the Deficiency

The Hartsville Unit A1 RPV shield wall is the first of six RPV shield walls IEW is under contract to supply to TVA. The edges on this first shield wall were cut incorrectly as a result of a misinterpretation of a weld detail by IEW employees. The repair by buttering was specified by the IEW Quality Assurance Manager based on his interpretation of the purchase specification and fabrication documents. Lack of documentation and NDE of the buttering can be attributed to the QA Manager's determination that this repair by welding did not meet the requirements of a major defect in C. F. Braun Specification 300-08 AB, paragraph 17.7.1.

After discovery of this condition by TVA and the resulting discussions between IEW and TVA, an agreement was reached between both parties that IEW's original determination was in error and that C. F. Braun specification 300-08 AB, paragraphs 17.7.1, 17.7.2, 18.1.6, and 19.1.2 did apply to this condition.

Safety Implications

Had the slag inclusion and lack of fusion in the repair by buttering gone undetected, the structural integrity of the RPV shield wall and the emergency core cooling system lines that penetrate it would have been jeopardized under dynamic loading that would result from earthquakes and a LOCA. Failure of this structure during such events has the potential to endanger the health and safety of the public.

Corrective Actions

IEW had not started the fabrication of the remaining five RPV shield walls when this deficiency was noted. Subsequently, the only RPV shield wall requiring corrective actions is the Hartsville Unit A1 shield wall. TVA will repair the faulty butter welds at the construction site during the field erection of the RPV shield wall using a repair procedure that has been approved by GE.

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Means Taken to Prevent Recurrence

IEW, since the identification of this problem, has taken the following actions to prevent recurrence of this condition on the remaining five RPV shield walls to be fabricated by IEW:

1. All cutting is now being done utilizing a metal template as a guide.
2. The need to follow the details of the purchase specification and fabrication documents with respect to documentation, technical engineer approval, and nondestructive examination of repairs has been reemphasized to all IEW employees.
3. All upper management at IEW has been requested to give this area increased attention in order to prevent a similar occurrence on one of the five remaining RPV shield walls.

TVA QES will audit IEW within the next six months to ensure that appropriate actions have been taken by IEW to prevent recurrence of this or a similar deficiency on the five RPV shield walls that IEW is fabricating.

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